

BEET (*Beta vulgaris*)
WILD BEET (*Beta vulgaris* spp. *maritima*)
Beet curly top; beet curly top virus

Panella, L. and L. E. Hanson
USDA-ARS, Sugarbeet Research Unit
Crops Research Lab
1701 Centre Ave.; Fort Collins, CO 80526-2083

EVALUATION OF *BETA* PIs FROM THE USDA-ARS NPGS FOR RESISTANCE TO CURLY TOP VIRUS, 2000: Thirty Plant Introductions (PIs) from the USDA-ARS National Plant Germplasm System (NPGS) (Garden Beet, Sugar Beet, Leaf Beet, Fodder Beet, and wild beet) were evaluated for resistance to the beet curly top virus in an artificially inoculated nursery, managed by the Beet Sugar Development Foundation (BSDF) in Kimberly, ID. The field was planted on 12 through 14 Jun. Planting was late to maximize the number of viruliferous leafhoppers available to transfer to the sugarbeets while they are in the 8- to 10-leaf stage. Plots were 12 ft long, two-rows with 22 in between rows and replicated twice. After the beets emerged, plots were trimmed to 8 ft long, thinned to one foot between beets, and cultivated. Viruliferous leafhoppers were released on 12 and 14 Jul to cause an artificial epiphytotic. One week before the leafhoppers were released in the nursery, they had been transferred onto curly top-infested beets to assure that they were viruliferous when placed in the field. Uniform infection was achieved by placing approximately 100,000 leafhoppers uniformly throughout the field, and then spreading the leafhoppers daily for the next week by dragging a 12-foot tarp across the field. The field was sprayed two weeks after release to kill the leafhoppers.

Plots were visually evaluated and rated on a Disease Index (DI) scale of 0 to 9 (no symptoms to dead) on 22 Aug and 06 Sep. An analysis of variance (PROC GLM - SAS) on the disease indices (visual evaluation scores) determined that there were highly significant differences ($P=0.05$) among entries on both dates. There was cultivator damage throughout the field and some plots were missing. Because only a few plots were missing from the analysis (5 on 22 Aug & 4 on 06 Sep), an LSD was calculated using two as the number of replications. The summer was very hot and dry and the epiphytotic extremely severe as indicated by the scores in the second evaluation. There were four accessions which were not significantly different from the resistant control at each rating period, three of which were not significantly different at both times. We would like to express our appreciation to the Beet Sugar Development Foundation (BSDF), which funded this research trial and to Mr. Terry Brown of the BSDF, who managed the nursery and helped with the evaluations. These data, and more information on the accessions evaluated, are available through the USDA-ARS GRIN database at <http://www.ars-grin.gov/npgs>.

Entry	Identification	Donor's ID	Disease Index*	
			22 Aug	06 Sep
1	Ames 19156	IDBBNR 9555	6.5	8.5
2	Ames 19166	Ramonskaja 931	8.0	8.0
3	Ames 19167	Jaltuskovskaja Odnosemiannaja	8.0	8.0
4	NSL 141994	043	8.0	8.0
5	PI 612767	AT3986A	5.0	7.0
6	PI 612766	AT3985A	4.0	7.0
7	PI 164806	PALAK	7.0	8.0
8	PI 171507	KOCABAS	7.0	9.0
9	PI 172735	IDBBNR 5297	8.0	8.5
10	PI 174062	PAZI	8.0	9.0
11	PI 198431 **	WB 171	7.0	8.0
12	PI 215577	IDBBNR 5381	7.5	9.0
13	PI 220509	LABLABOO	9.0	9.0
14	PI 222233	LABOO	6.0	7.5
15	PI 408965	Pusa Jyoti	8.0	9.0
16	PI 476322	Belocerkovskaja odnosemennaja	7.5	8.0
17	PI 504205	Wild beet	7.5	7.5
18	PI 504206 **	Wild beet	9.0	9.0
19	PI 518780	IDBBNR 9607	7.5	8.0
20	PI 590664	IDBBNR 4288	4.5	8.0
21	PI 590703 **	IDBBNR 4373	7.0	8.0
22	PI 590755	IDBBNR 4572	8.0	8.5
23	PI 590763	IDBBNR 4587	7.5	9.0
24	PI 590766 **	IDBBNR 4591	6.0	7.0
25	PI 596528	RS-2B	7.0	7.5
26	PI 604031	IDBBNR 3863	6.5	8.0
27	PI 608798	A77-50	7.0	8.0
28	PI 608799	A78-30	6.0	7.5
29	PI 608803	A80-17	5.0	7.0
30	PI 546518 **	IDBBNR 9685	9.0	.
31	PI 546534	Beta G6040 - Resistant Check	3.5	6.0
32	911032	FC718 - Susceptible Check	6.5	7.5
LSD _(0.05) **			2.01	1.26

*Disease Index (DI) scale = 0 (no symptoms) to 9 (plant death).

**There were missing plots for these accessions; the LSD was generated using 2 replications, which makes this an inappropriate comparison statistic for these accessions to the control.